

# **Lake Erie International Field Year 2005**

**Program Coordinators:  
Stephen Brandt & Stuart Ludsin  
NOAA-GLERL  
Ann Arbor, MI**

# Background

- GLERL wrote proposal to NOAA to charter large research vessel(s)
  - Conduct an integrative, multidisciplinary research program on Lake Erie
  - Spearhead IFYGL II, emphasis on biology & chemistry
  - Understand bio-physical coupling to aid forecasting & allow for ecosystem management
- Proposal was funded (1<sup>st</sup> learned on Dec. 22)
  - \$450K to charter 90 days of R/V Guardian
  - Will likely receive similar funds during 2006 & 2007

# Major Support

## – NOAA

- About \$3M (ship support, buoy systems, personnel, cash)
  - >15 Principal Investigators
- R/V Laurentian and R/V Cyclops to Lake Erie

## – EPA

- \$450K cost match for ship time (R/V Lake Guardian)

## – National Sea Grant

- \$250K for \$50K projects (RFP to be released this week)
- Identifies areas of expertise needed
- Proposals due March 14

## – Environment Canada (NWRI)

- Met stations, thermister strings, velocity profilers, transmissometers, CTDs
- R/V LIMNOS deployment

# Outside Support

## – **Ohio Sea Grant**

- \$25K to support research
- Use of 3 research vessels in the west basin
- Housing at Stone Laboratory
- Website reporting capabilities

## – **New York Sea Grant**

- \$25K to support research

## – **Lake Erie Committee agencies**

- **Historical database access & vessel support:**
  - Ohio Dept. of Natural Resources
  - Pennsylvania Boat & Fish Commission
  - Ontario Ministry of Natural Resources
  - New York State Dept. of Environmental Conservation
  - Michigan Dept. of Natural Resources

## – **USGS**

- Access to vessels (Musky II, Bowfin) in exchange for collaboration
- Research assistance

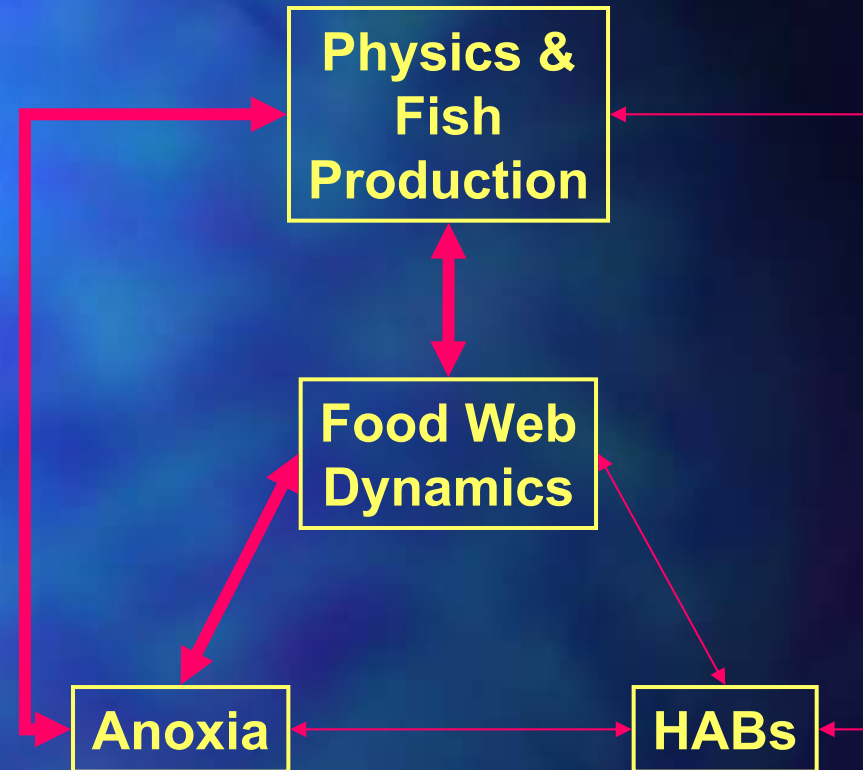


# Key Goals

- Lake Erie research program will:
  - Integrative (involve GLERL & non-GLERL agencies & researchers)
  - Multidisciplinary (biological, chemical, & physical coupling)
  - Result in a product (e.g., maps, scientific understanding, and/or forecasting tools/ability to benefit management agencies)
  - Use scientific plans developed by 2004 GLERL Lake Erie Science Workshop and Lake Erie Millennium Network Workshops

# Primary Research Foci

- Anoxia
  - Forecasting
  - Food Web Impacts
- Fish Production
  - Food Webs
  - Physics
  - Anoxia
- Harmful Algal Blooms



# Detailed Research Foci

- Central basin hypoxia/anoxia
  - Models to understand magnitude, timing, & duration
    - Hindcast anoxia (past 50 yr), short-term forecasts
  - Explore ecological consequences of hypoxia
    - Emphasis on understanding & predicting how fish distributions, behavior, consumption, & production are influenced by hypoxia

# Detailed Research Foci

- Physics & Fish Production
  - Physical habitat (oxygen, temperature) effects
    - Recruitment, growth, distributions
  - How does food web structure influence fish
    - Role of exotics
    - Prey quality & availability
  - Use a variety of approaches
    - Field sampling, modeling, laboratory analyses, field/lab experiments, moorings/buoys



# End Products

- Scientific understanding
  - Derived from integration of field collections and modeling
    - E.g., spatially-explicit bioenergetics modeling of walleye growth
    - Food web modeling
    - Network analysis
- Valuable predictive tools
  - 3-D hydrodynamic model to predict temp., sediments, DO & nutrients
  - Refinement of remote sensing algorithms and hydrodynamics to predict harmful algal blooms
- Value to fisheries management
  - Models to predict habitat (e.g., temperature, oxygen, turbidity) across Erie (deemed critical per the 2004 Lake Erie Science workshop)
  - Assessment of how hypoxia might influence fisheries production
  - Better understanding of fish distributions, growth, & production

# NOAA-GLERL Investigators

■ Brandt	Fish ecology
■ Ludsin	Fish Ecology
■ Mason	Fish ecology, food-web modeling
■ Pothoven	Fish ecology
■ Fahnenstiel	Phytoplankton ecology/HABs
■ Vanderploeg	ZP ecology/HABs
■ Lozano	Benthic macroinvertebrate ecology
■ Nalepa	Benthic macroinvertebrate ecology
■ Hawley	Buoy deployment, sediment transport
■ Ruberg	Buoy deployment & sensor development
■ Raikow	Stable isotopes
■ Leshkevich	Remote sensing
■ Eadie	Sediment trapping
■ McCormick	Lake circulation
■ Schwab	Hydrodynamics modeling

# Coordination

- Lake Erie Committee
  - Jeff Tyson on planning team (Lake Erie Committee rep)
- Lake Erie LaMP
  - Stuart Ludsin on working group
- Lake Erie Millennium
  - Jan Ciborowski, Jeff Reutter, & Murray Charlton on planning team
- Regional Working Group of Presidents Executive Order
  - P. Horvatin on planning team



# Other Potential Collaborations

## – Known Lake Erie investigations

- NOAA Center of Excellence for Great Lakes and Human Health
  - HABs, beach closings, water quality in western Lake Erie
- Acoustics & trawling program in central basin (late July)
  - USGS, OMNR, ODNR
- NSF Biocomplexity project
  - OSU (Dave Culver lead)
- Quantification of oxygen trends and 3-D hydrodynamics model validation (proposed)
  - U of Waterloo (Ralph Smith)
- Develop new technologies (e.g., fast repetition-rate fluorometer)
  - Funded NSERC proposal to develop technologies, U of Waterloo (Ralph Smith)



# Timetable

February:	Continue to Develop Collaborations
March 14-21:	Identify Major University Partners & Funding
Late March:	All P.I. Meeting to Finalize Plans
April:	Detailed Cruise Preparations
May – October:	Field Season
November:	All P.I. Meeting & Plan for 2006

# Project Website

<http://www.glerl.noaa.gov/res/Programs/erie/>